GM78R05A

1A LOW DROPOUT VOLTAGE REGULATOR

Description

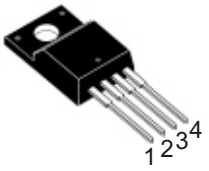
THE GM78R05A is a low - dropout voltage regulator, suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R05A is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

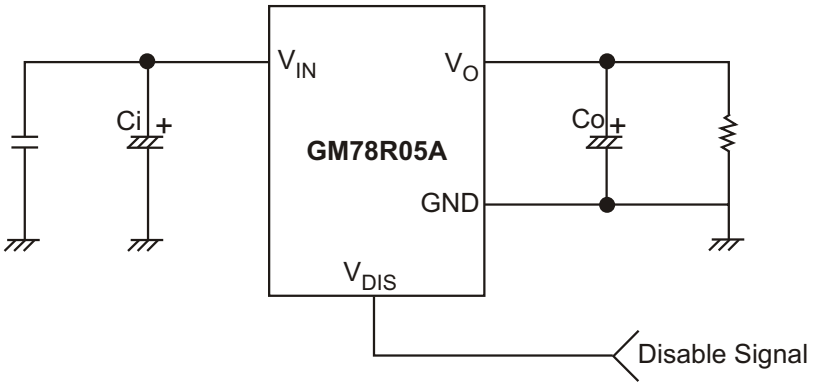
- **1A / 5V Output low dropout voltage regulator**
- **TO-220 Full-Mold package (4PIN)**
- **Overcurrent protection, Thermal shutdown**
- **Overvoltage protection, Short-Circuit Protection**
- **With output disable function**

TYPICAL APPLICATION CIRCUITS

TO- 220F- 4L



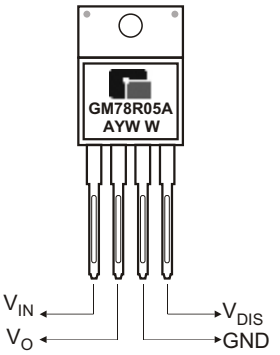
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



Ci is required if regulator is located an appreciable distance from power supply filter.
Co improves stability and transient response. (Co > 47μF)

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO- 220F- 4L



A : Assembly Location
Y : Year
WW : Weekly

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R05ATBF4T	TO- 220F- 4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

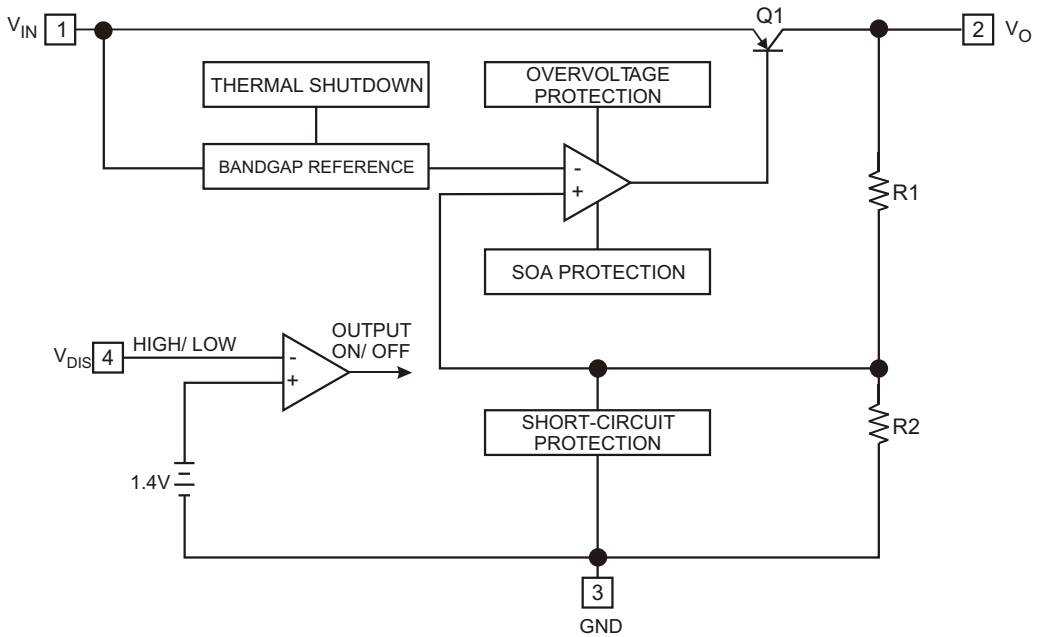
Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

◆ Electrical Characteristics (V_{IN} = 7V, I_O = 0.5A, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	4.88	5	5.12	V
Load Regulation	R_{load}	5mA < I_O < 1A	-	0.1	2.0	%
Line Regulation	R_{line}	6V < V_{IN} < 12V	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	I_O = 1A	-	-	0.5	V
Disable Voltage High	$V_{dis}H$	Output Active	2.0	-	-	V
Disable Voltage Low	$V_{dis}L$	Output Disabled	-	-	0.8	V
Disable Input Current High	$I_{dis}H$	V_{dis} = 2.7V	-	-	20	μA
Disable Input Current Low	$I_{dis}L$	V_{dis} = 0.4V	-	-	-0.4	mA
Quiescent Current	I_Q	I_O = 0A	-	-	10	mA

Note:
1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
   -. Pneumatic heat sink fixture.
   -. Clamping pressure 60psi through 12mm diameter cylinder.
   -. Thermal grease applied between PKG and heat sink fixture.

◆ BLOCK DIAGRAM(POSITIVE LOGIC)



◆ TYPICAL PERFORMANCE CHARACTERISTICS

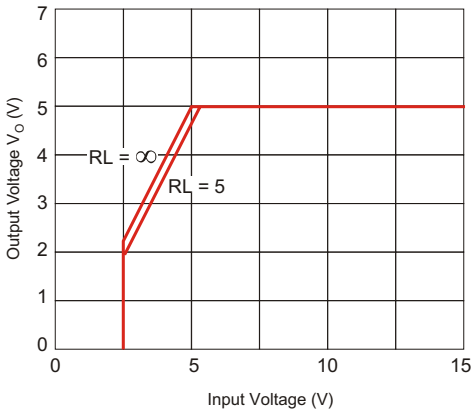


Figure 1. Output Voltage vs. Input Voltage

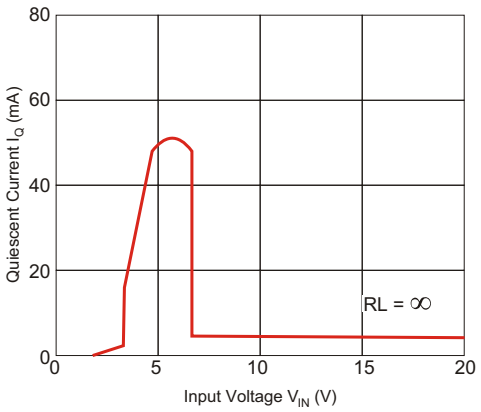


Figure 2. Quiescent Current vs. Input Voltage

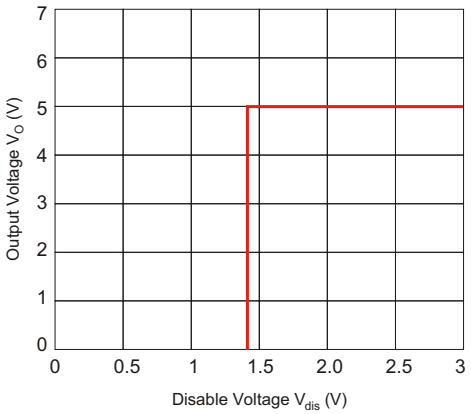


Figure 3. Output Voltage vs. Disable Voltage

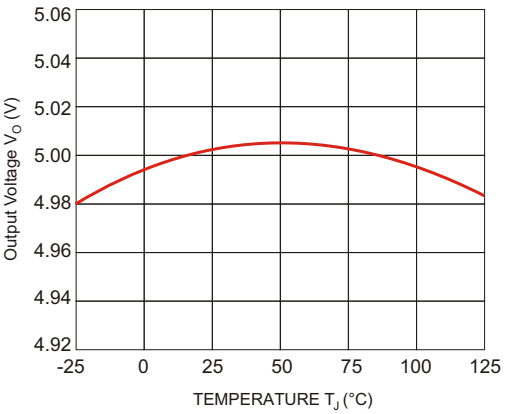


Figure 4. Output Voltage vs. Temperature (T_J)

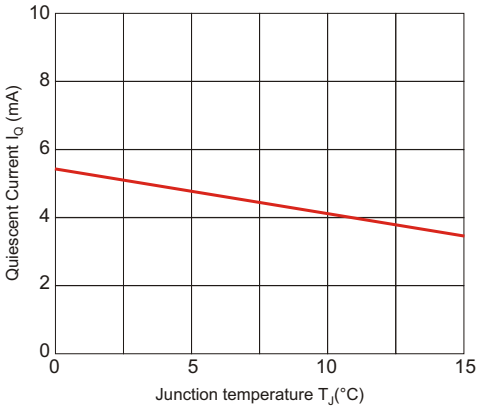


Figure 5. Quiescent Current vs. Temperature(T_J)

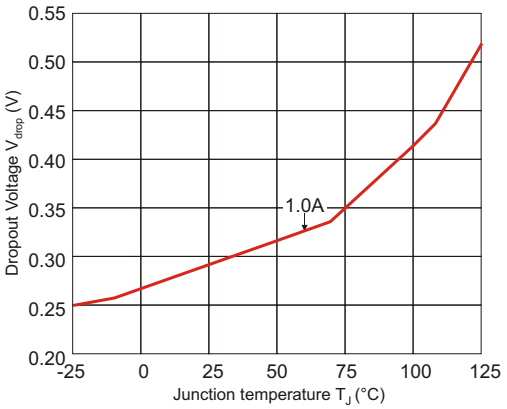


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

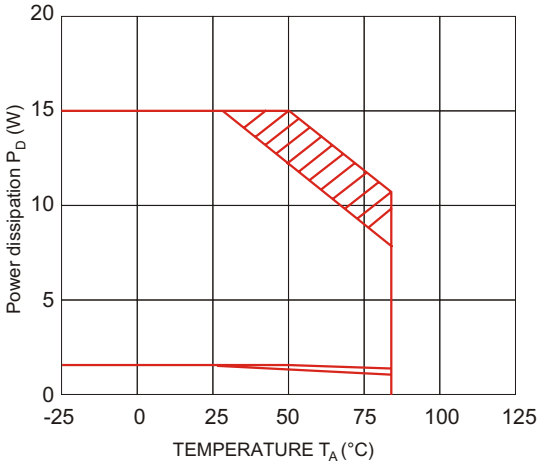
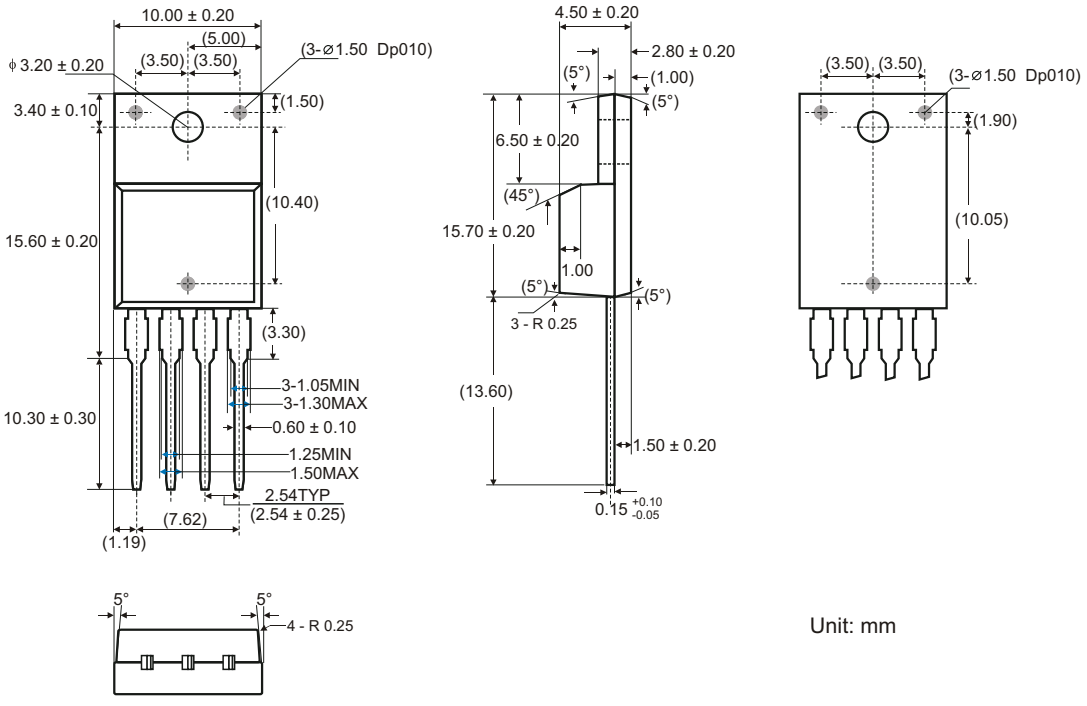


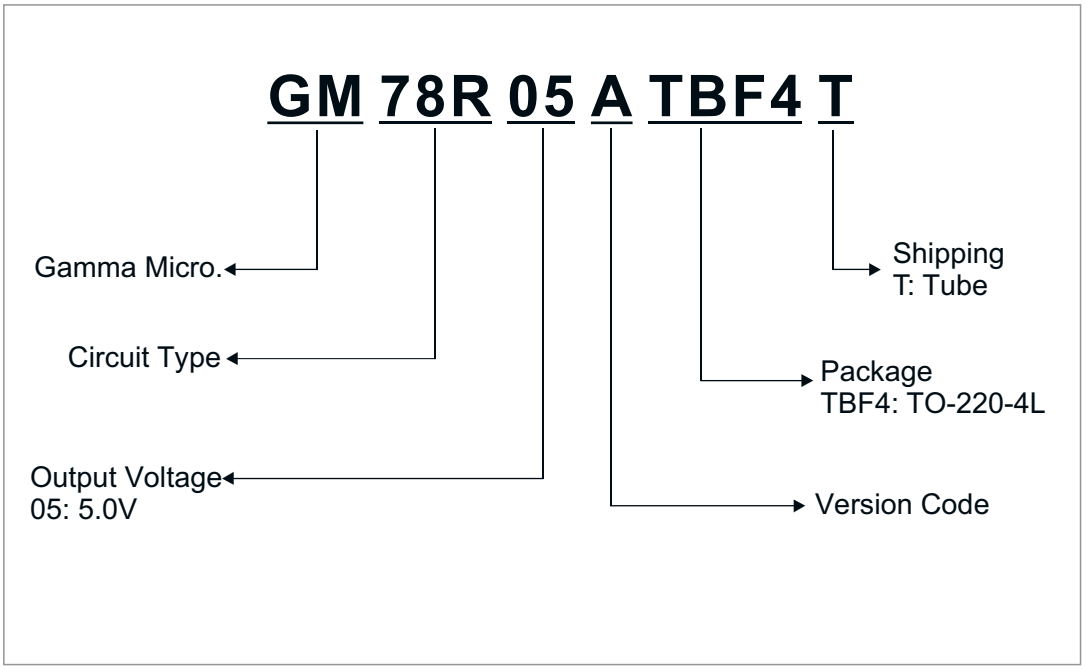
Figure 7. Power Dissipation vs. Temperature(T_A)

◆ TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS



Unit: mm

◆ ORDERING NUMBER



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GM78R09A

1A LOW DROPOUT VOLTAGE REGULATOR

Description

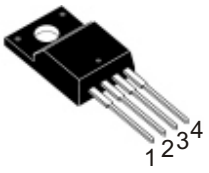
THE GM78R09A is a low - dropout voltage regulator, suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R09A is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

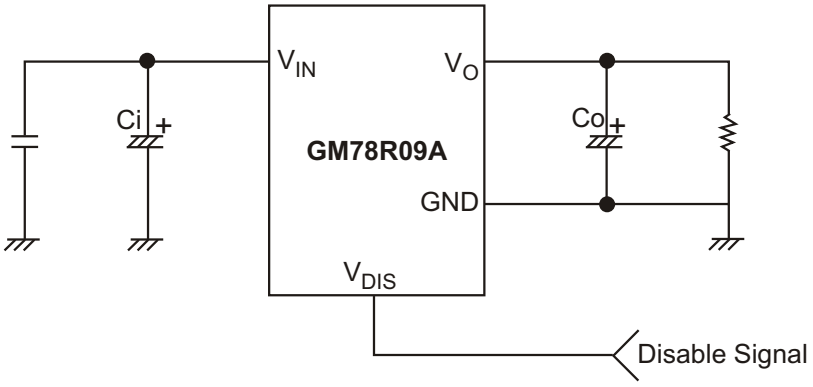
- **1A / 9.0 V Output low dropout voltage regulator**
- **TO-220 Full-Mold package (4PIN)**
- **Overcurrent protection, Thermal shutdown**
- **Overvoltage protection, Short-Circuit Protection**
- **With output disable function**

TYPICAL APPLICATION CIRCUITS

TO - 220F - 4L



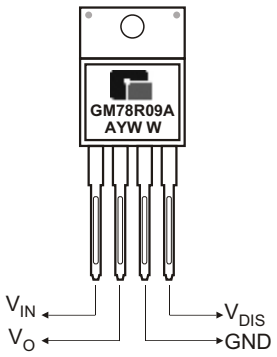
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



Ci is required if regulator is located an appreciable distance from power supply filter.
Co improves stability and transient response. (Co > 47μF)

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



A : Assembly Location
Y : Year
WW : Weekly

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R09ATBF4T	TO - 220F -4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

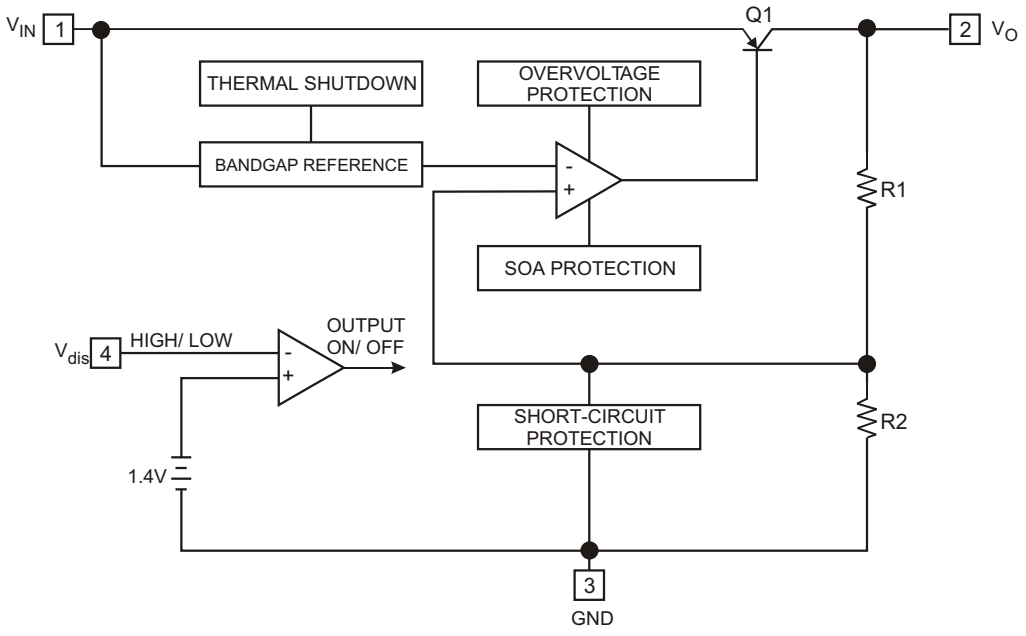
Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

◆ Electrical Characteristics (V_{IN} = 7V, I_O = 0.5A, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	8.78	9	9.22	V
Load Regulation	R_{load}	5mA < I_O < 1A	-	0.1	2.0	%
Line Regulation	R_{line}	6V < V_{IN} < 12V	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	I_O = 1A	-	-	0.5	V
Disable Voltage High	$V_{dis}H$	Output Active	2.0	-	-	V
Disable Voltage Low	$V_{dis}L$	Output Disabled	-	-	0.8	V
Disable Input Current High	$I_{dis}H$	V_{dis} = 2.7V	-	-	20	μA
Disable Input Current Low	$I_{dis}L$	V_{dis} = 0.4V	-	-	-0.4	mA
Quiescent Current	I_Q	I_O = 0A	-	-	10	mA

Note:
1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
   -. Pneumatic heat sink fixture.
   -. Clamping pressure 60psi through 12mm diameter cylinder.
   -. Thermal grease applied between PKG and heat sink fixture.

◆ BLOCK DIAGRAM(POSITIVE LOGIC)



◆ TYPICAL PERFORMANCE CHARACTERISTICS

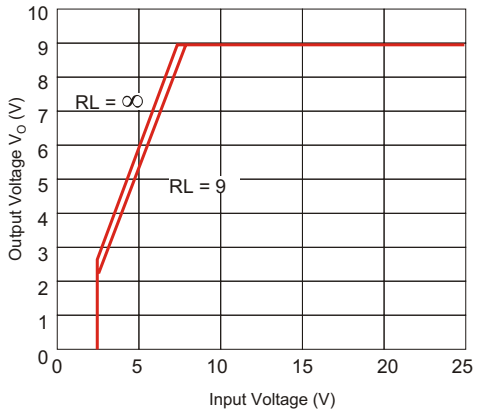


Figure 1. Output Voltage vs. Input Voltage

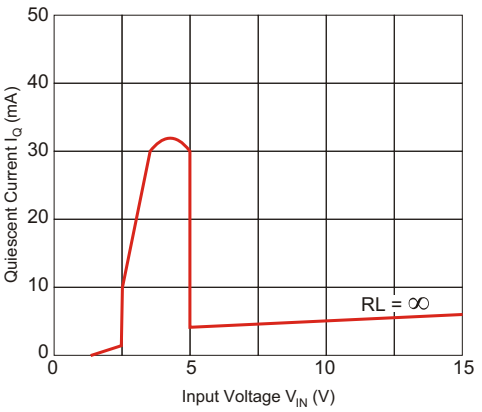


Figure 2. Quiescent Current vs. Input Voltage

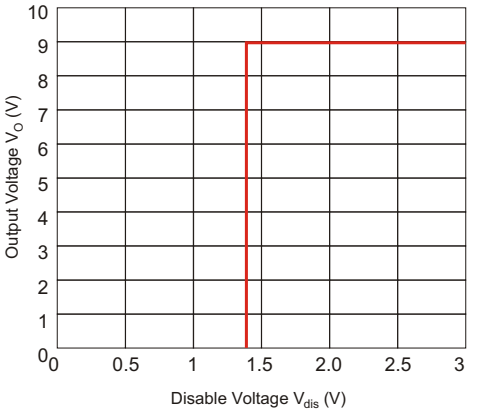


Figure 3. Output Voltage vs. Disable Voltage

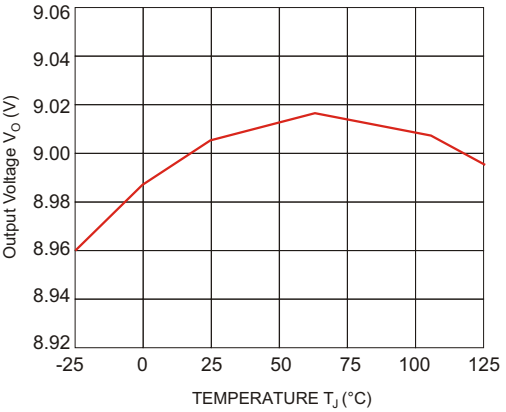


Figure 4. Output Voltage vs. Temperature (T_J)

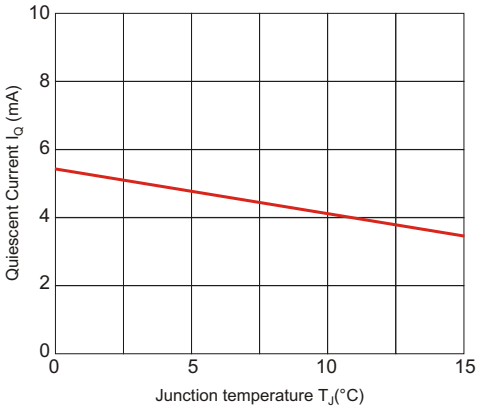


Figure 5. Quiescent Current vs. Temperature(T_J)

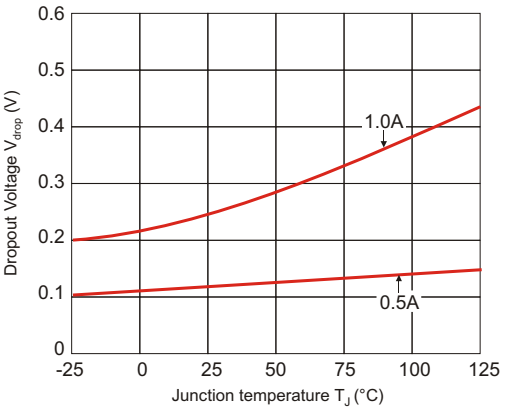


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

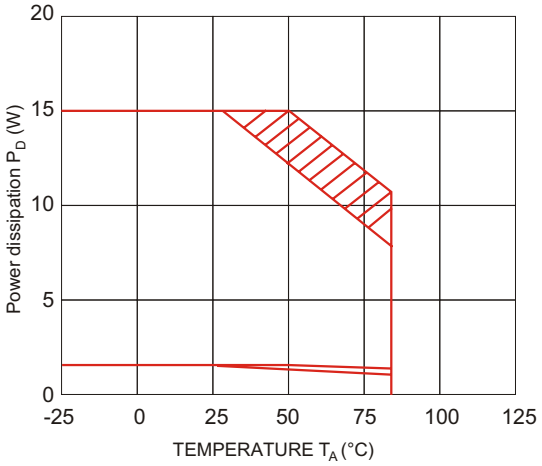
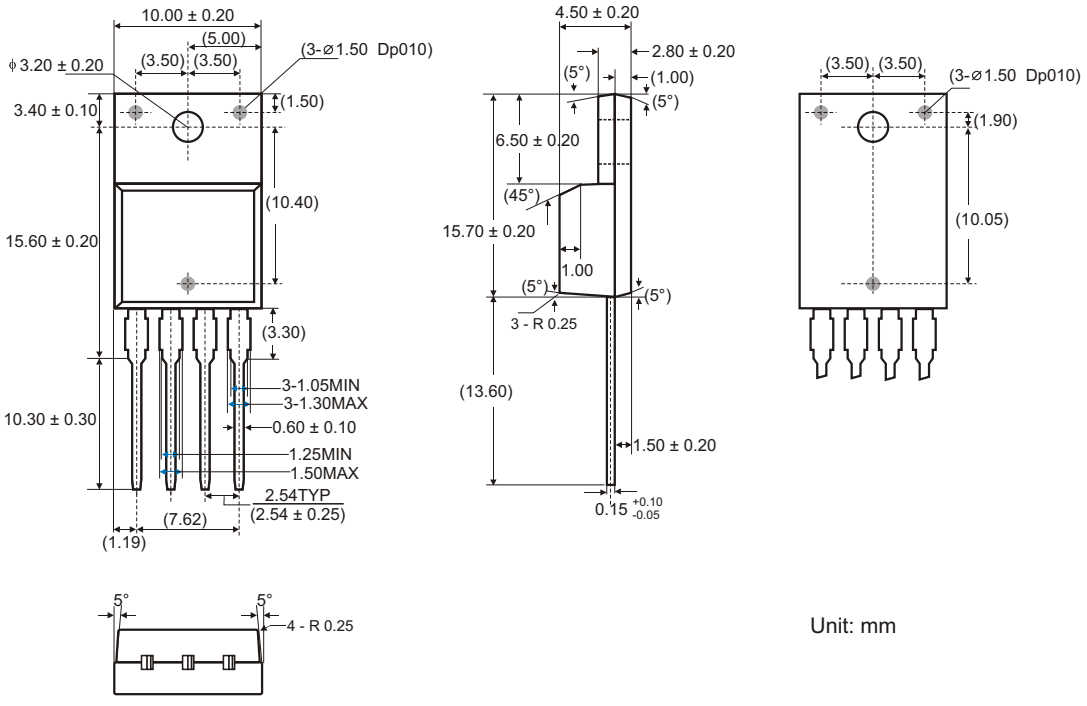


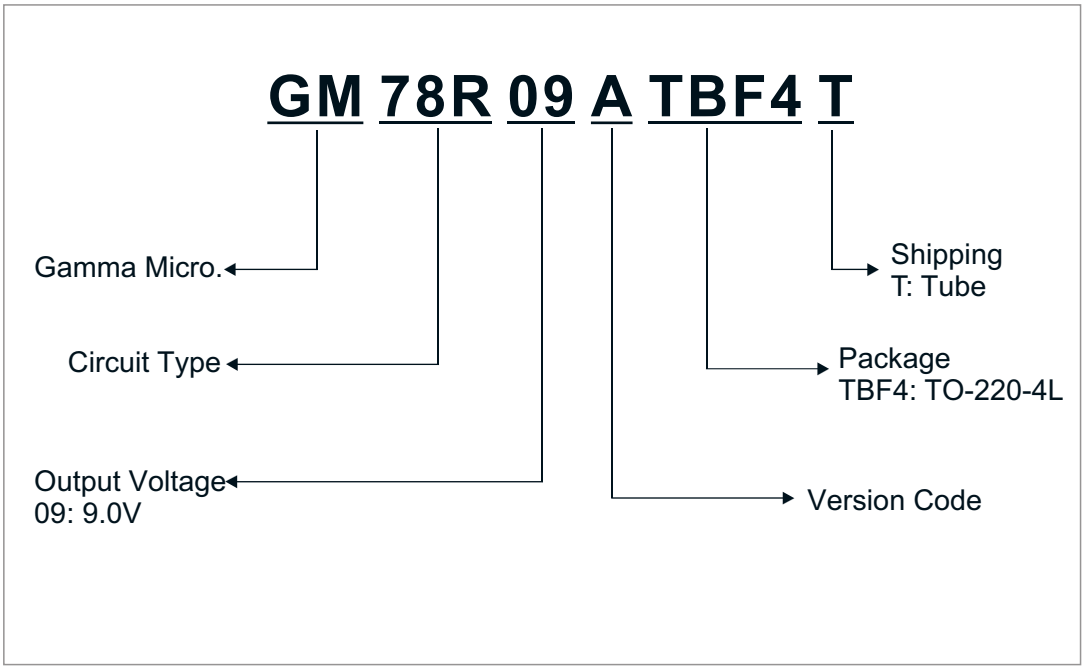
Figure 7. Power Dissipation vs. Temperature(T_A)

◆ TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS



Unit: mm

◆ ORDERING NUMBER



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GM78R12A

1A LOW DROPOUT VOLTAGE REGULATOR

Description

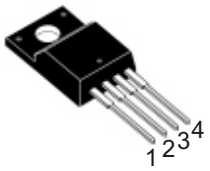
THE GM78R12A is a low - dropout voltage regulator, suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R12A is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Features

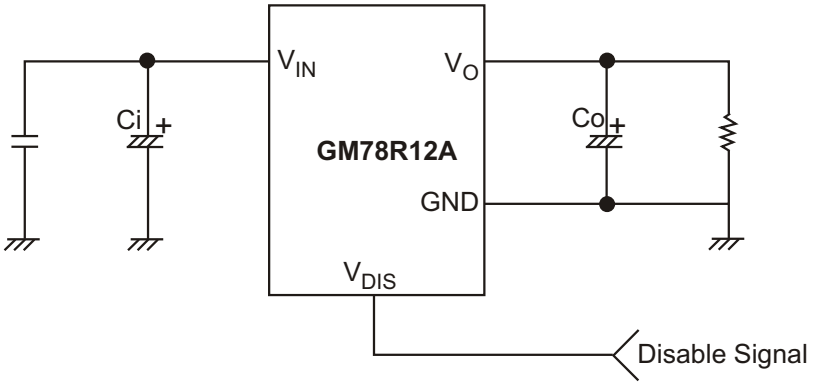
- **1A / 12V Output low dropout voltage regulator**
- **TO-220 Full-Mold package (4PIN)**
- **Overcurrent protection, Thermal shutdown**
- **Overvoltage protection, Short-Circuit Protection**
- **With output disable function**

TYPICAL APPLICATION CIRCUITS

TO-220F- 4L



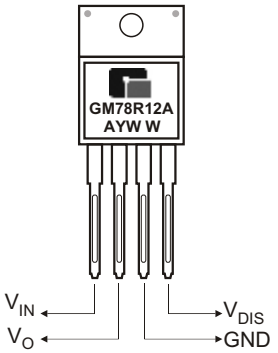
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



Ci is required if regulator is located an appreciable distance from power supply filter.
Co improves stability and transient response. (Co > 47μF)

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



A : Assemble Location
Y : Year
WW : Work Week

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R12ATBF4T	TO - 220F-4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

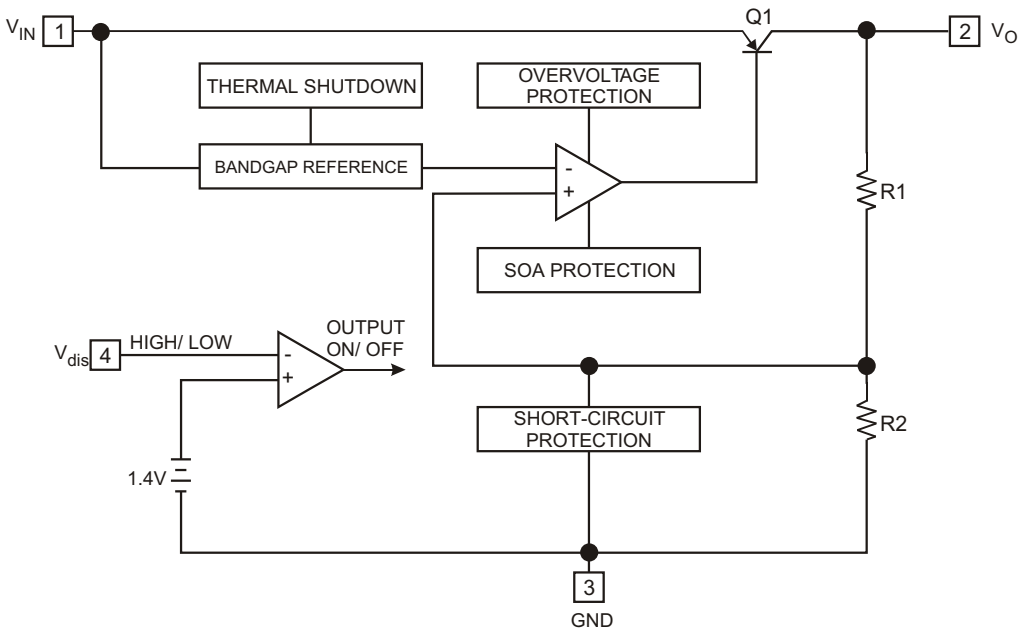
Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

◆ Electrical Characteristics (V_{IN} = 15V, I_O = 0.5A, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	11.7	12	12.3	V
Load Regulation	R_{load}	5mA < I_O < 1A	-	0.1	2.0	%
Line Regulation	R_{line}	6V < V_{IN} < 12V	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	I_O = 1A	-	-	0.5	V
Disable Voltage High	$V_{dis}H$	Output Active	2.0	-	-	V
Disable Voltage Low	$V_{dis}L$	Output Disabled	-	-	0.8	V
Disable Input Current High	$I_{dis}H$	V_{dis} = 2.7V	-	-	20	μA
Disable Input Current Low	$I_{dis}L$	V_{dis} = 0.4V	-	-	-0.4	mA
Quiescent Current	I_Q	I_O = 0A	-	-	10	mA

Note:
1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
   -. Pneumatic heat sink fixture.
   -. Clamping pressure 60psi through 12mm diameter cylinder.
   -. Thermal grease applied between PKG and heat sink fixture.

◆ BLOCK DIAGRAM (POSITIVE LOGIC)



◆ TYPICAL PERFORMANCE CHARACTERISTICS

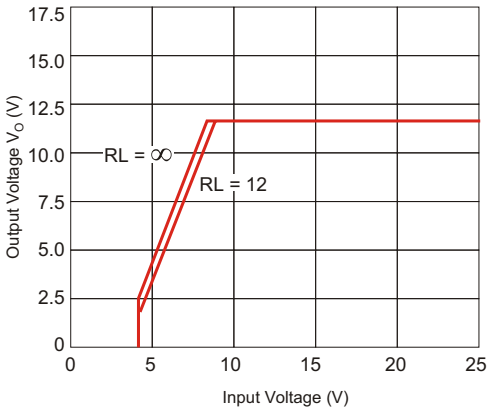


Figure 1. Output Voltage vs. Input Voltage

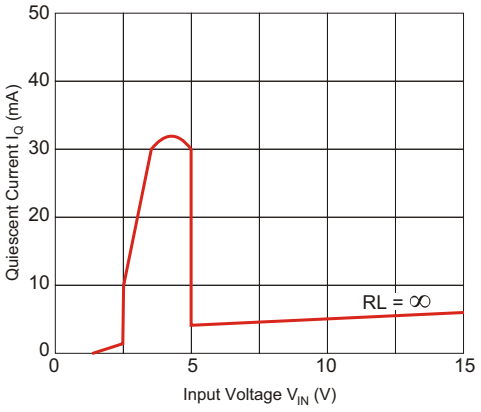


Figure 2. Quiescent Current vs. Input Voltage

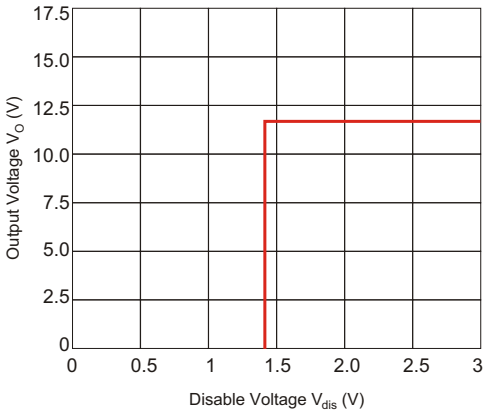


Figure 3. Output Voltage vs. Disable Voltage

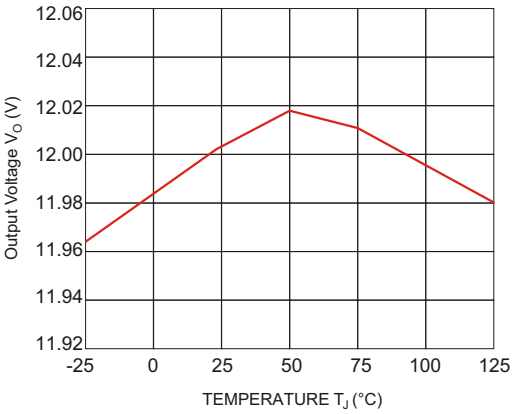


Figure 4. Output Voltage vs. Temperature (T_J)

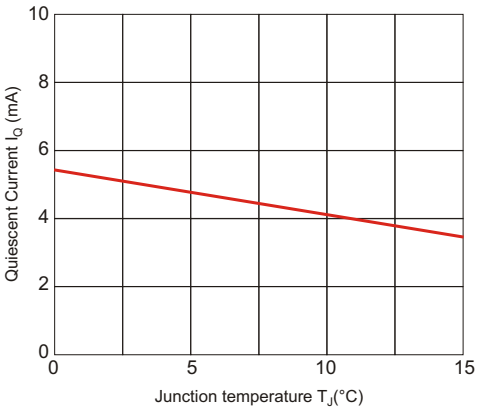


Figure 5. Quiescent Current vs. Temperature(T_J)

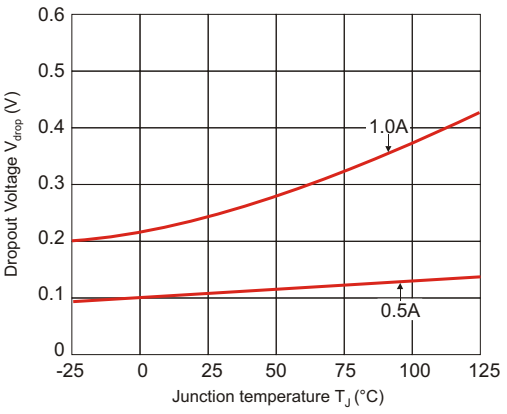


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

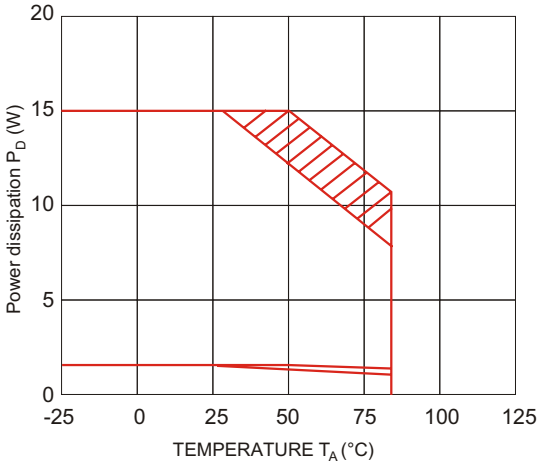
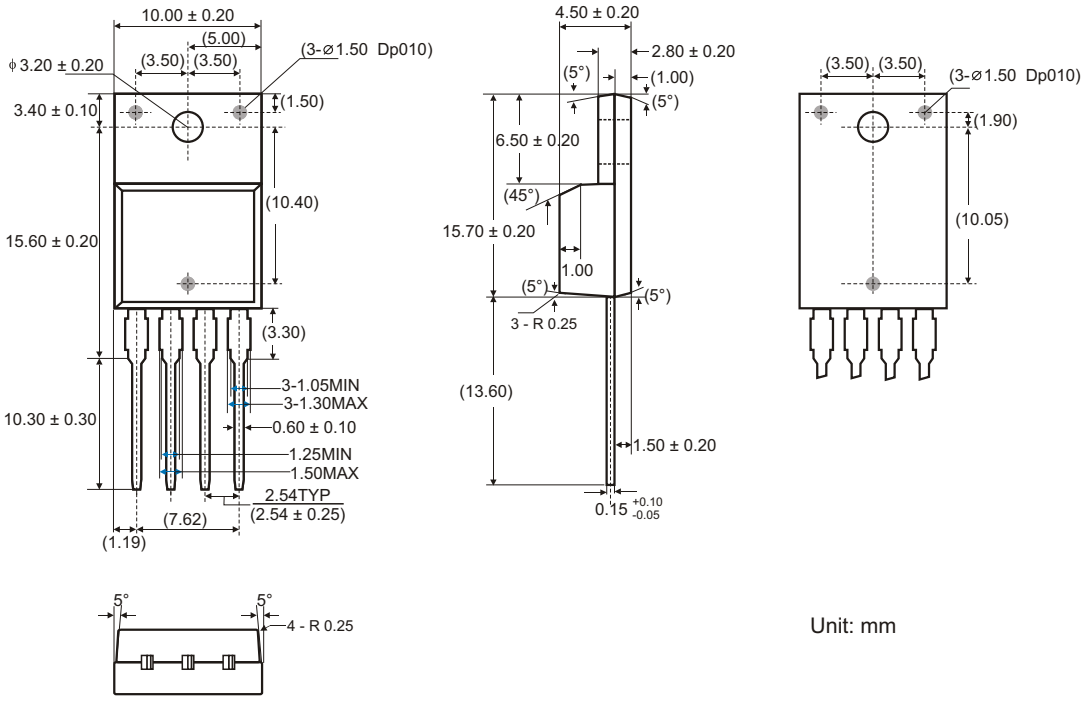


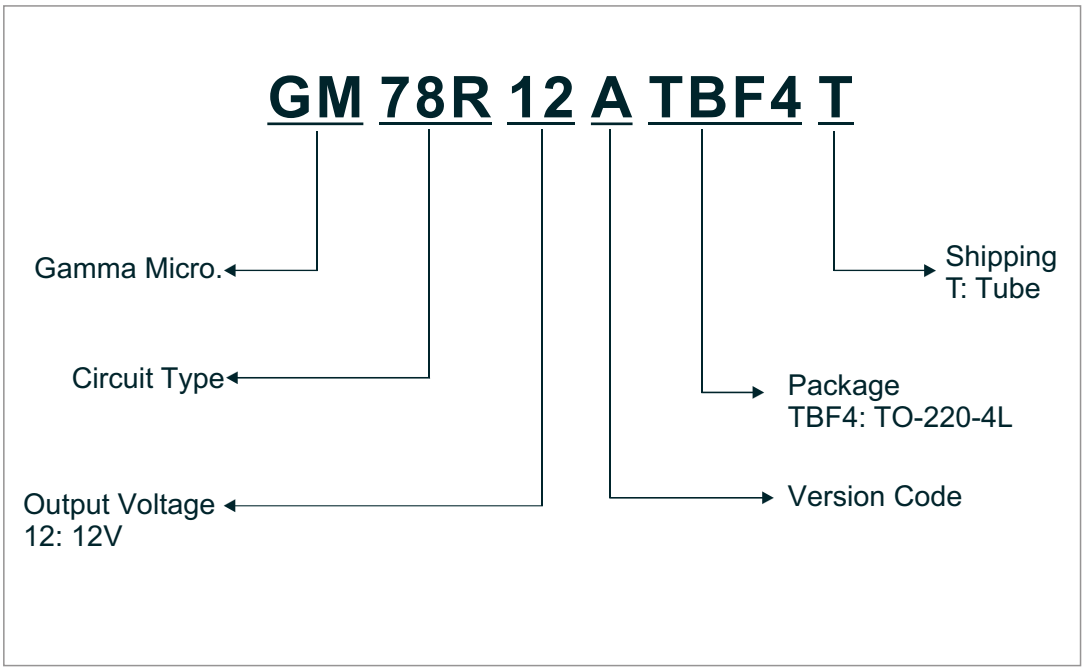
Figure 7. Power Dissipation vs. Temperature(T_A)

◆ TO-220FPAB-4 PACKAGE OUTLINE DIMENSIONS



Unit: mm

◆ ORDERING NUMBER



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GM78R33A

1A LOW DROPOUT VOLTAGE REGULATOR

Description

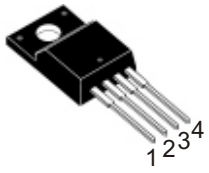
The GM78R33A is a low - dropout voltage regulator, suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 leads full mold package. Dropout voltage of GM78R33A is below 0.5V in full rated current (1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable func-

Features

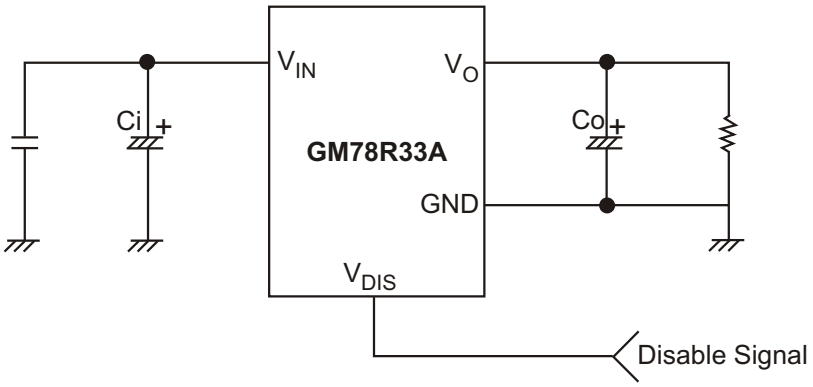
- **1A / 3.3V Output low dropout voltage regulator**
- **TO-220 Full-Mold package (4PIN)**
- **Overcurrent protection, Thermal shutdown**
- **Overvoltage protection, Short-Circuit Protection**
- **With output disable function**

TYPICAL APPLICATION CIRCUITS

TO-220F- 4L



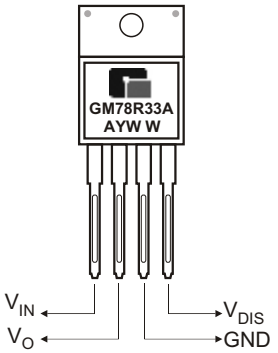
1. V_{IN}
2. V_O
3. GND
4. V_{DIS}



Ci is required if regulator is located an appreciable distance from power supply filter.
Co improves stability and transient response. (Co > 47μF)

◆ MARKING INFORMATION & PIN CONFIGURATIONS

TO - 220F - 4L



A : Assemble Location
Y : Year
WW : Work Week

◆ ORDERING INFORMATION

Ordering Number	Package	Shipping
GM78R33ATBF4T	TO - 220F-4L	50 Units/ Tube

* For detail Ordering Number identification, please see last page.

◆ ABSOLUTE MAXIMUM RATINGS

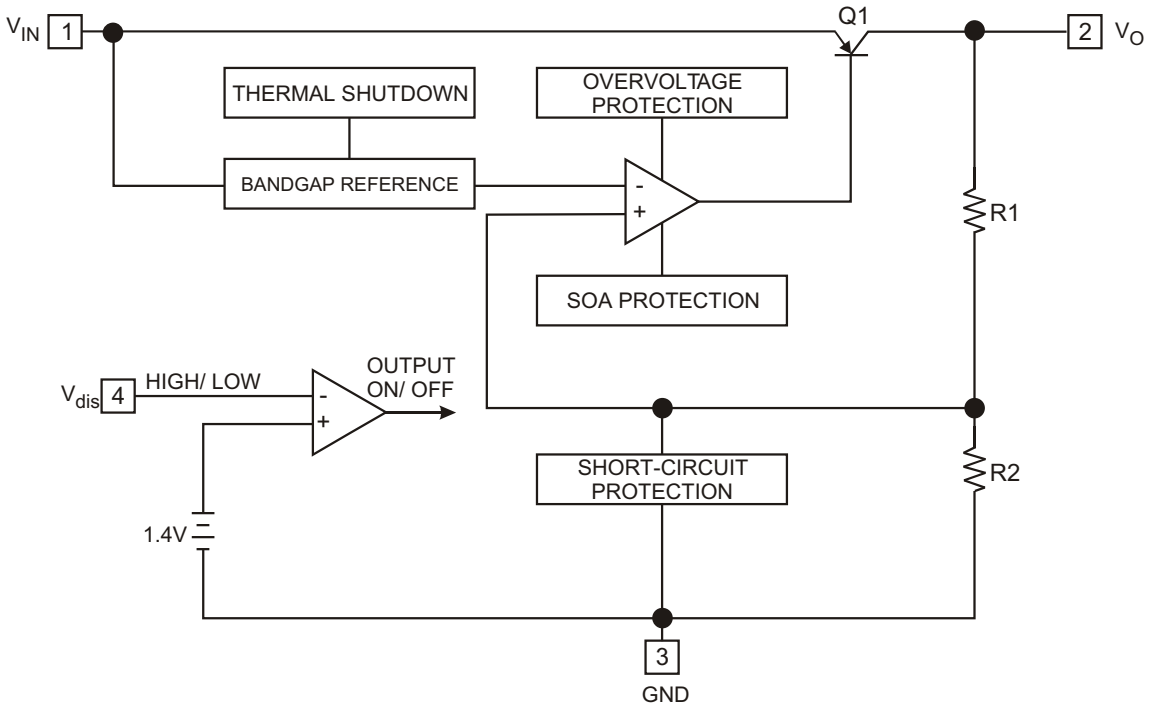
Symbol	Parameter	Value	Unit	Remark
V_{IN}	Input Voltage	35	V	-
V_{DIS}	Disable Voltage	35	V	-
I_O	Output Current	1.0	A	-
P_{d1}	Power Dissipation 1	1.5	W	No Heatsink
P_{d2}	Power Dissipation 2	15	W	Whit Heatsink
T_J	Junction Temperature	+150	°C	-
T_{OPR}	Operating Junction Temperature	-20 ~ +80	°C	-
R_{JC}	Thermal Resistance, Junction - to Case (Note 2)	4.31	°C/W	-
R_{JA}	Thermal Resistance, Junction - to Air (Note 2)	48.83	°C/W	-
T_{tsd}	Thermal Shutdown Temperature	150	°C	-

◆ Electrical Characteristics (V_{IN} = 5V, I_O = 1.0A, T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	3.22	3.3	3.38	V
Load Regulation	R_{load}	5mA < I_O < 1A	-	0.1	2.0	%
Line Regulation	R_{line}	6V < V_{IN} < 12V	-	0.5	2.5	%
Ripple Rejection Ratio	RR	Note 1	45	55	-	dB
Dropout Voltage	V_{drop}	I_O = 1A	-	-	0.5	V
Disable Voltage High	$V_{dis}H$	Output Active	2.0	-	-	V
Disable Voltage Low	$V_{dis}L$	Output Disabled	-	-	0.8	V
Disable Input Current High	$I_{dis}H$	V_{dis} = 2.7V	-	-	20	μA
Disable Input Current Low	$I_{dis}L$	V_{dis} = 0.4V	-	-	-0.4	mA
Quiescent Current	I_Q	I_O = 0A	-	-	10	mA

Note:
1. These parameters, although guaranteed, are not 100% tested in production.
2. Junction - to - case thermal resistance test environments.
   -. Pneumatic heat sink fixture.
   -. Clamping pressure 60psi through 12mm diameter cylinder.
   -. Thermal grease applied between PKG and heat sink fixture.

◆ BLOCK DIAGRAM(POSITIVE LOGIC)



◆ TYPICAL PERFORMANCE CHARACTERISTICS

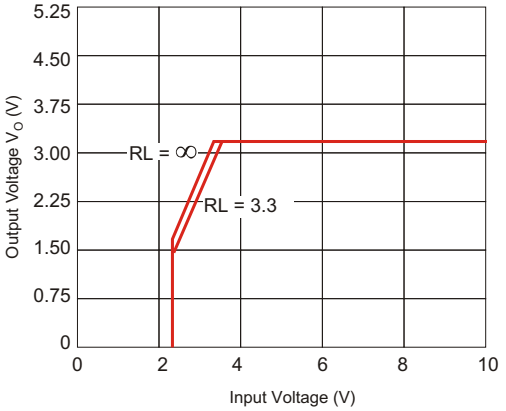


Figure 1. Output Voltage vs. Input Voltage

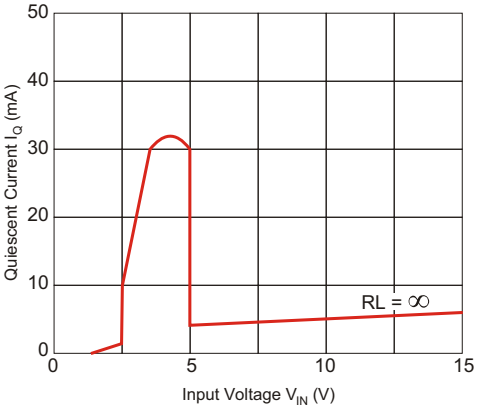


Figure 2. Quiescent Current vs. Input Voltage

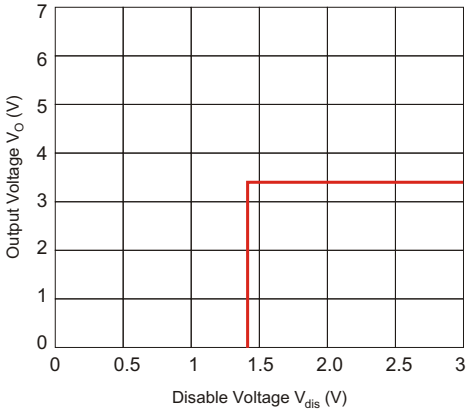


Figure 3. Output Voltage vs. Disable Voltage

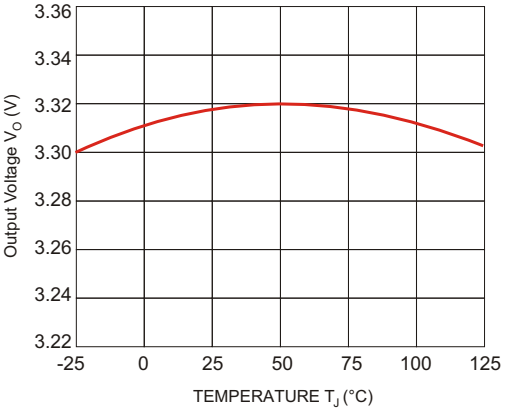


Figure 4. Output Voltage vs. Temperature (T_J)

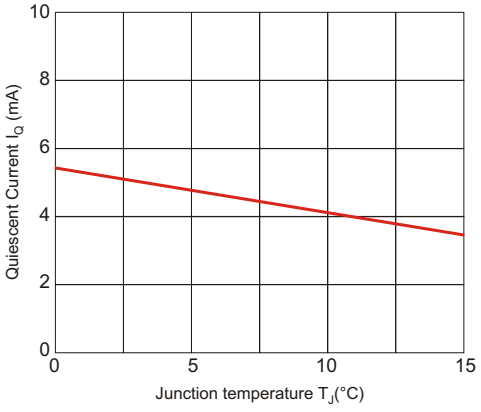


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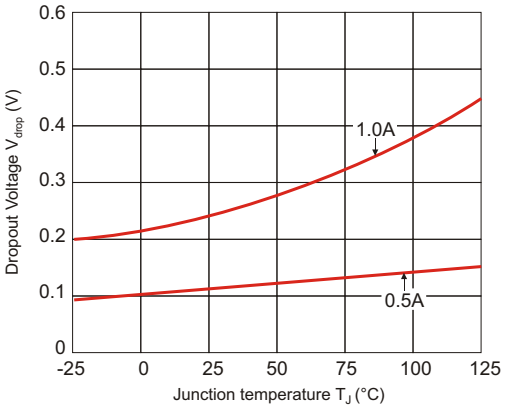


Figure 6. Dropout Voltage vs. Temperature(T_J)

◆ TYPICAL PERFORMANCE CHARACTERISTICS

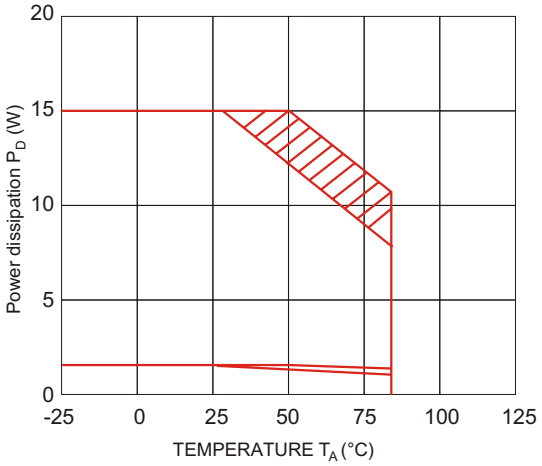
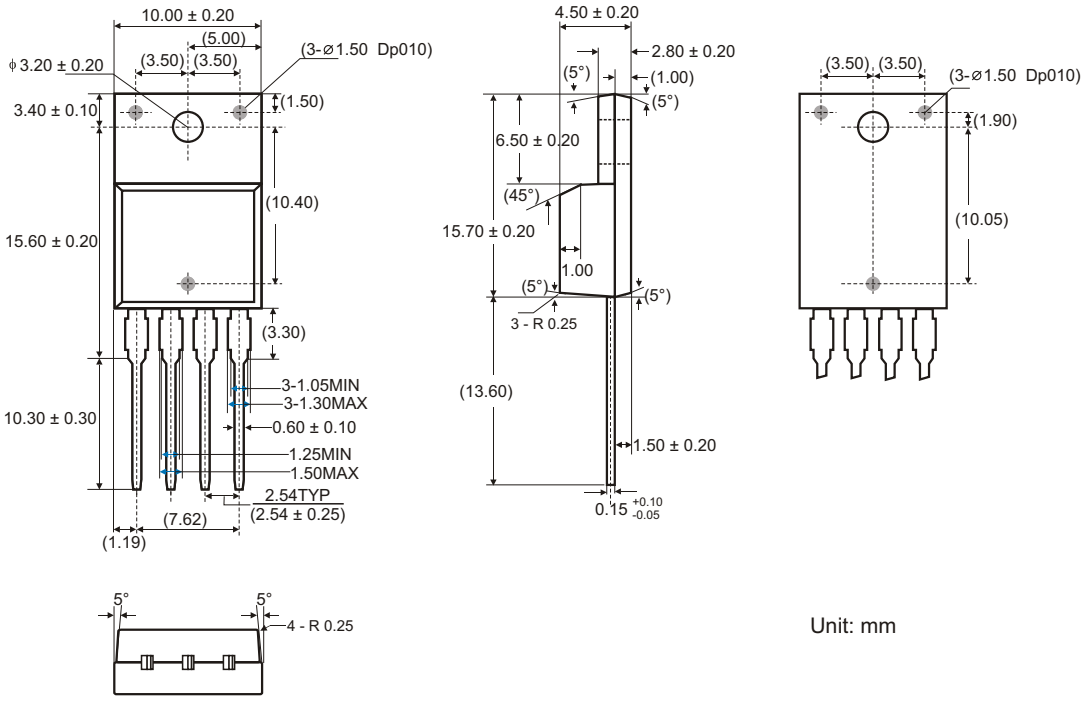


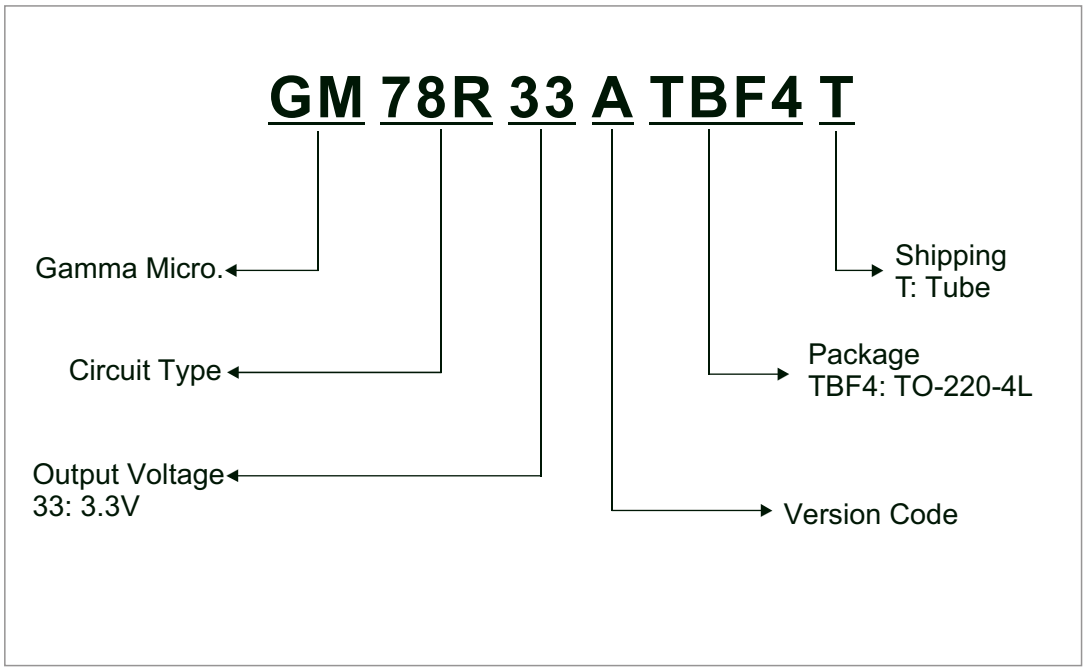
Figure 7. Power Dissipation vs. Temperature(T_A)

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Unit: mm

◆ ORDERING NUMBER



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